FXS/FXO Voice Card
For
AM3440 A/B/C
USER'S MANUAL

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21 JUL 2010 Version 3

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1. PRODUCT INTRODUCTION

1.1 Description

There are two options for AM3440 FXS/FXO plug-in card: 12FXS/FXO and 24 FXS/FXO. 12FXS/FXO is designed for the single slot, and 24 FXS/FXO is designed for dual slots of Loop-AM3440 series. They both allow voice frequency interfaces to be multiplexed as a 64 Kbps DS0 signal onto a digital network. FXS card provides voice Interfaces connect to telephones. FXO provides connections from telephone lines, either from a central office or from a PBX in RJ11X12 connector (12FXO) or in a single RJ21X (Telco 50pin) connector (24FXO).

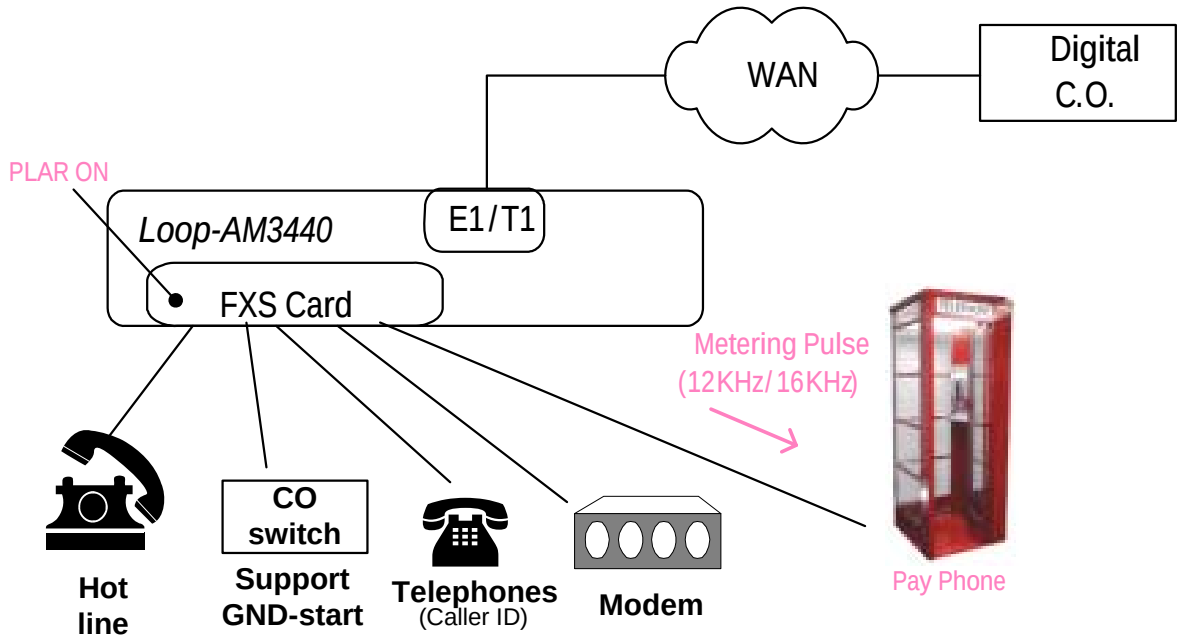
1.2 Specification

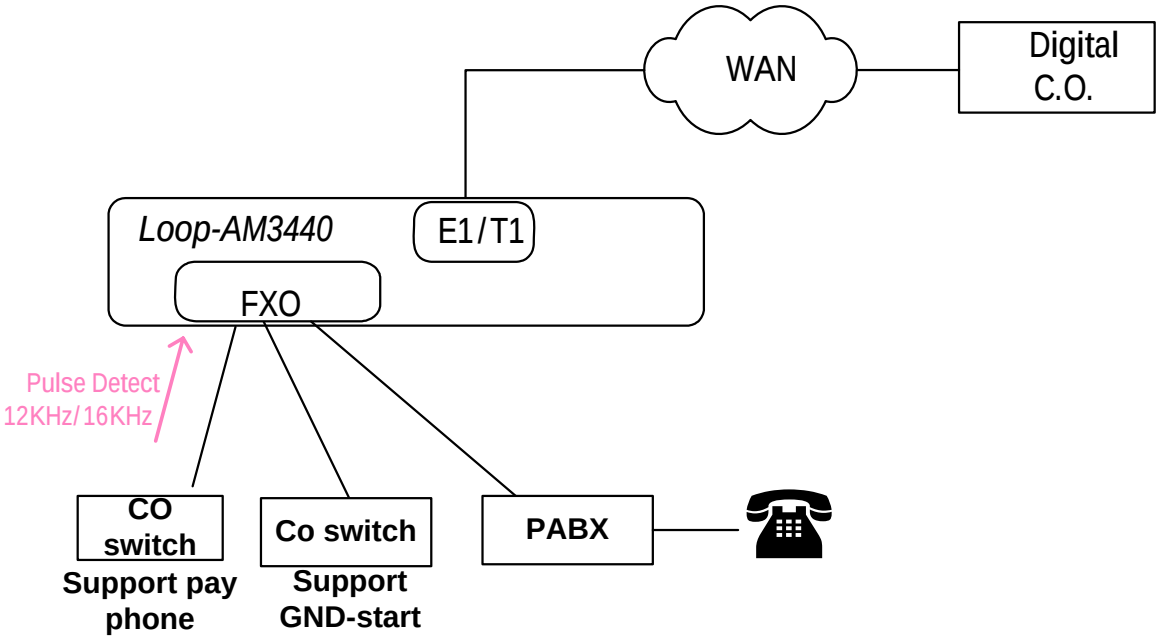
Voice Card (12FXS,12FXO, 24FXS, 24FXO)

12 FXS/FXO Connector	Twelve RJ11	
24 FXS/FXO Connector	One RJ21X	
Alarm Conditioning	CGA busy after 2.5 seconds of LOS, LOF	
Encoding	A-law or μ-law, user selectable together for all	
AC Impedance	Balanced 600 or 900 ohms (selectable together for all)	
Longitudinal Conversion Loss	> 46dB	
Cross talk measure	Max -70dBm0	
Gain Adjustment	-21 to +10 dB / 0.1dB step transmit & receive	
Signal/ Distortion	> 25dB with 1004 Hz, 0dBm input	
Frequency Response	- 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712	
Idle Channel Noise	Max. –65 dBm0p	
Variation of Gain	±0.5dB	
FXO	Ringing REN	0.5B (AC)
	Detectable Ringing	25 Vrms
	Loop Resistance	≤ 1800 Ω
	DC Impedance (ON-HOOK)	> 1M Ω
	DC Impedance (OFF-HOOK)	235 Ω @ 25mA feed 90 Ω @ 100mA feed
FXS Loop Feed	-48Vdc or -24Vdc with 25mA current limit per port Jumper Selectable: 25mA, 30mA, 35mA	
FXS signalling	Normal / Automatic Ring down	
FXS Ringing	1 REN at 5K meters per port 16.7Hz, 20Hz, 25Hz, 50Hz, user selectable for all ports 38 to 85 Vrms (sine wave), 76 Vrms for default Ring Voltage 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR	
Signaling	Loop Start, DTMF, pulse, PLAR, Battery Reverse	
Optional Signaling (for special order)	Ground Start, Metering pulse (12 KHz, 16 KHz), and P(in PLAR mode, PLAR signalling bits are programmable.	
Signaling Bit A,B,C,D	Programable bit	

- All in-band signaling tones are carried transparently by the digitizing process.
- Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.
- -24Vdc power is for FXS PCB version L and up

1.3 Application Illustration





2 INSTALLATION

2.1 Default Configuration

Item	Option/ Range	Default
A/ μ Law	A Law, μ Law	A Law
Impedance	600 ohm, 900 ohm	600 ohm
Tx Gain	-21 to +10 dB	-3 dB
Rx Gain	-21 to +10 dB	-3 dB
PLAR Ring Cadence	2" on 4" off, 1" on 2" off	2" on 4" off
Ring Frequency	16.7, 20, 25, 50 Hz	20 Hz
Metering Pulse	On, Off	Off
Metering Pulse Frequency	12 KHz, 16 KHz	16 KHz
Metering Level	1Vrms, 2.4Vrms	2.4Vrms
PLAR	On, Off	Off

Table 2-1 FXS Plug-in card Default Configuration

Item	Option/ Range	Default
A/ μ Law	A Law, μ Law	A Law
Impedance	600 ohm, 900 ohm	600 ohm
Tx Gain	-21 to +10 dB	-3 dB
Rx Gain	-21 to +10 dB	-3 dB
Trunk Condition	On hook, Off hook	On hook
Line Polarity	Normal, Reverse	Normal
Metering Pulse Frequency	12 KHz, 16 KHz	16 KHz
Metering Pulse Detect Mode	Normal, Packet	Normal
Metering Pulse Decode Level	-19 to -47 dBm	-27 dBm

Table 2-2 FXO Plug-in card Default Configuration

2.2 RJ11 Pin Assignment

Pin Number	Line Color	Description
1		Unassigned
2		Unassigned
3	Red	Ring lead
4	Green	Tip lead
5		Unassigned
6		Unassigned

Table 2-3 RJ11 Connector Pin Assignment - FXS/ FXO Card

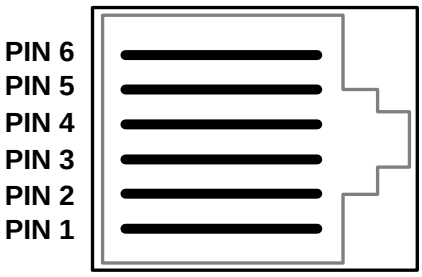


Figure 2-1 RJ11 Connector

2.3 RJ21X Pin Assignment

LEFT Card Line No	RJ21X PIN (teleco 50 PIN)		RIGHT Card Line Number	RJ21X PIN (teleco 50PIN)	
	Ring	Tip		Ring	Tip
Line 1	1	26	Line 1	13	38
Line 2	2	27	Line 2	14	39
Line 3	3	28	Line 3	15	40
Line 4	4	29	Line 4	16	41
Line 5	5	30	Line 5	17	42
Line 6	6	31	Line 6	18	43
Line 7	7	32	Line 7	19	44
Line 8	8	33	Line 8	20	45
Line 9	9	34	Line 9	21	46
Line 10	10	35	Line 10	22	47
Line 11	11	36	Line 11	23	48
Line 12	12	37	Line 12	24	49

Table 2-4 RJ21X Connector Pin Assignment – 24 FXS/ FXO Card

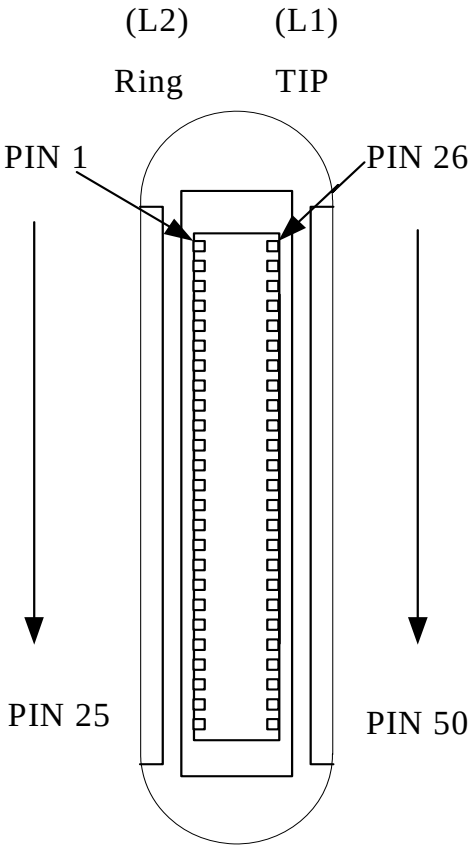
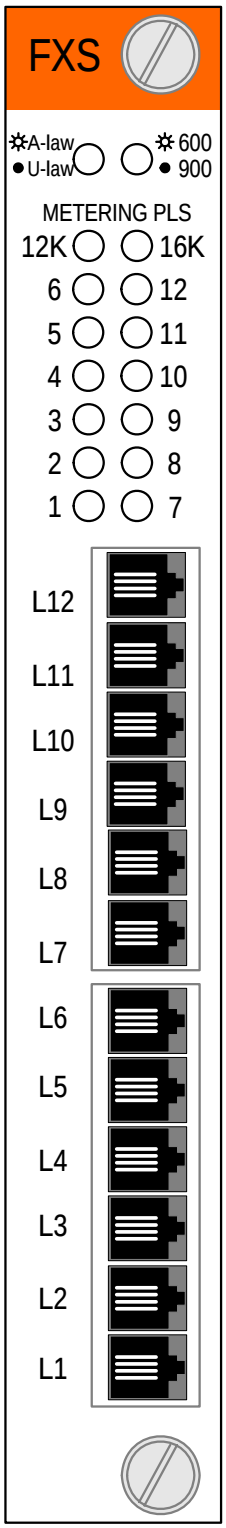


Figure 2-2 RJ21X Connector – FXS, FXO, and MAG Cards

2.4 LED Indication

2.4.1 12 FXS Card



● No Light ○ Light ☼ Show Flashing △ Fast Flashing

Table 3- 1 LED Indication – 12FXS Card

■LED Indication for Encoding/ Impedance: A-law, μ-law/ 600 ohm, 900 ohm

LED			Indication
Encoding	Impedance	Color	
A-law, μ-law	600, 900		
○	○	Green	A-law mode, 600 ohm
○	●	Green	A-law mode, 900 ohm
●	○	Green	μ-law mode, 600 ohm
●	●	Green	μ-law mode, 900 ohm

■ LED Indication for Metering Pulse

LED			Indication
12K	16K	Color	
●	●	Off	Metering Pulse is OFF
○	●	Green	12 KHz metering pulse is ON
△	●	Green flash 8 Hz	12 KHz pulse is operating
●	○	Green	16 KHz metering is ON
●	△	Green flash 8 Hz	16 KHz metering pulse is operating

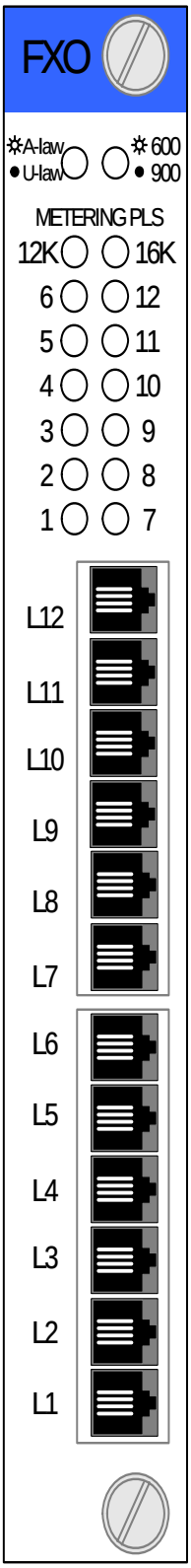
■ LED Indication for Line 1 to Line 12

LED		Indication
L1 to L12	Color	
●	All LED off	No input power
●	Off	Tip Lead Open, [Ground Start Mode]
○	Green	Normal
☼	Green flash 1 Hz	Off Hook
☼	Green flash 4 Hz	Ring Lead Ground, [Ground Start Mode]
△	Green flash 8 Hz	1. Metering Pulse [Metering Pulse Mode] 2. Battery Reverse
△	Green flash 16 Hz	Ringing
○	Red	Alarm
☼	Red flash 1 Hz	(1) Alarm at Off Hook status (2) The other party hangs up first on the phone at PLAR ON status

Fast Flashing light △: When either one of the L1~L12 port is under metering pulse mode (that is, the LED light of that particular port is flashing green light), the metering pulse LED (12K or 16K, depending on its pulse frequency) will also flash in green light at the same time. But if the LED flashes because of battery reverse, the metering pulse LED (12K or 16K) will not have any response.

2.4.2 12FXO Card

● No Light ○ Light ☼ Show Flashing △ Fast Flashing



LED Indication - 12FXO Card

■ **LED Indication for Encoding/ Impedance: A-law, μ-law/ 600 ohm, 900 ohm**

LED			Indication
Encoding	Impedance	Color	
A-law, μ-law	600, 900		
○	○	Green	A-law mode, 600 ohm
○	●	Green	A-law mode, 900 ohm
●	○	Green	μ-law mode, 600 ohm
●	●	Green	μ-law mode, 900 ohm

■ **LED Indication for Metering Pulse**

LED			Indication
12K	16K	Color	
●	●	Off	Metering Pulse is OFF
○	●	Green	12 KHz metering is ON
△	●	Green flash 8 Hz	12 KHz pulse is operating
●	○	Green	16 KHz metering is ON
●	△	Green flash 8 Hz	16 KHz pulse is operating

■ **LED Indication for Line 1 to Line 12**

LED		Indication
L1 to L12	Color	
●	Off	Tip Lead Open or Line Empty, [Ground Start Mode]
○	Green	Normal
☼	Green flash 1 Hz	Off Hook
☼	Green flash 4 Hz	Ring Lead Ground, [Ground Start Mode]
△	Green flash 8 Hz	1. Metering Pulse [Metering Pulse Mode] 2. Battery Reverse
△	Green flash 16 Hz	Ringing
○	Red	Alarm
☼	Red flash 1 Hz	Alarm at Off Hook status

Fast Flashing light △: When either one of the L1~L12 port is under metering pulse mode (that is, the LED light of that particular port is flashing green light), the metering pulse LED (12K or 16K, depending on its pulse frequency) will also flash in green light at the same time. But if the LED flashes because of battery reverse, the metering pulse LED (12K or 16K) will not have any response.

Table 3- 2 LED Indication – 24FXS Plug-in card

● No Light ○ Light ☼ Show Flashing △ Fast Flashing

■ LED Indication for Encoding/ Impedance: A-law, μ-law/ 600 ohm, 900 ohm

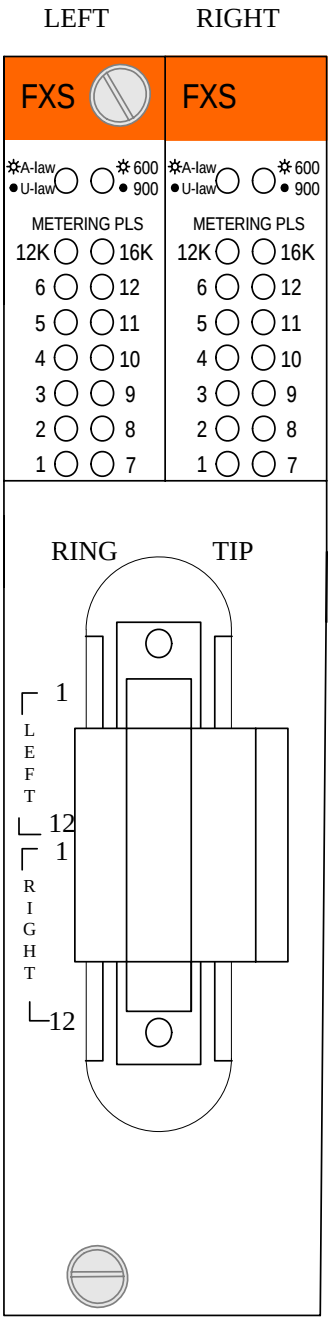
LED			Indication
Encoding	Impedance	Color	
A-law μ-law	600 900		
○	○	Green	A-law mode, 600 ohm
○	●	Green	A-law mode, 900 ohm
●	○	Green	μ-law mode, 600 ohm
●	●	Green	μ-law mode, 900 ohm

■ LED Indication for LEFT /RIGHT Side Plug-in card Metering Pulse

LED			Indication
12K	16K	Color	
●	●	Off	Metering Pulse is OFF
○	●	Green	12 KHz metering is ON
△	●	Green flash 8 Hz	12 KHz pulse is operating
●	○	Green	16 KHz metering is ON
●	△	Green flash 8 Hz	16 KHz pulse is operating

■ LED Indication for LEFT /RIGHT Side Plug-in card from Line 1 to Line 12

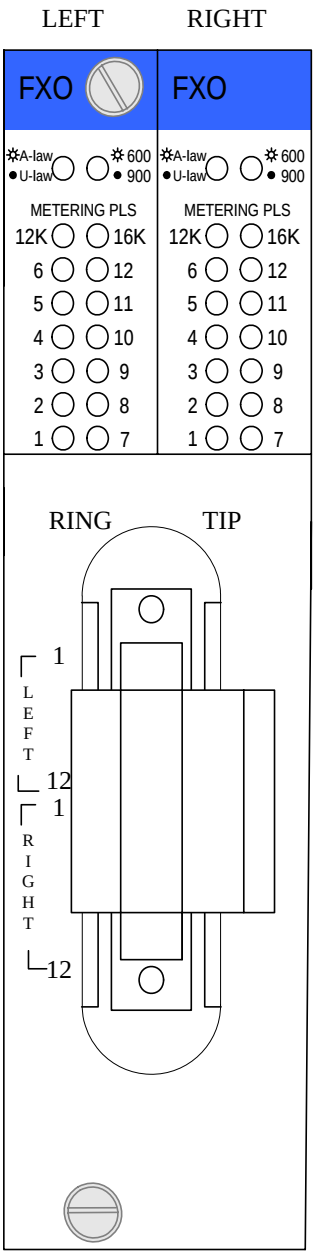
LED		Indication
L1 to L12	Color	
●	All LED off	No input power
●	Off	Tip Lead Open, [Ground Start Mode]
○	Green	Normal
☼	Green flash 1 Hz	Off Hook
☼	Green flash 4 Hz	Ring Lead Ground, [Ground Start Mode]
△	Green flash 8 Hz	1. Metering Pulse [Metering Pulse Mode] 2. Battery Reverse
△	Green flash 32 Hz	Ringing
○	Red	Alarm
☼	Red flash 1 Hz	3. Alarm at Off Hook status The other party hangs up first on the phone at PLAR ON status



Fast Flashing light △: When either one of the 1~12 port is under metering pulse mode (that is, the LED light of that particular port is flashing green light), the metering pulse LED (12K or 16K, depending on its pulse frequency) will also flash in green light at the same time. But if the LED flashes because of battery reverse, the metering pulse LED (12K or 16K) will not have any response.

Table 3- 3 LED Indication - 24FXO Plug-in card

● No Light ○ Light ☼ Show Flashing △ Fast Flashing



■ LED Indication for Encoding/ Impedance: A-law, μ-law/ 600 ohm, 900 ohm

LED			Indication
Encoding	Impedance	Color	
A-law μ-law	600 900		
○	○	Green	A-law mode, 600 ohm
○	●	Green	A-law mode, 900 ohm
●	○	Green	μ-law mode, 600 ohm
●	●	Green	μ-law mode, 900 ohm

■ LED Indication for LEFT /RIGHT Side Plug-in card Metering Pulse

LED			Indication
12K	16K	Color	
●	●	Off	Metering Pulse is OFF
○	●	Green	12 KHz metering is ON
△	●	Green flash 8 Hz	12 KHz pulse is operating
●	○	Green	16 KHz metering is ON
●	△	Green flash 8 Hz	16 KHz pulse is operating

■ LED Indication for LEFT /RIGHT Side Plug-in card from Line 1 to Line 12

LED		Indication
L1 to L12	Color	
●	Off	Tip Lead Open or Line Empty, [Ground Start Mode]
○	Green	Normal
☼	Green flash 1 Hz	Off Hook
☼	Green flash 4 Hz	Ring Lead Ground, [Ground Start Mode]
△	Green flash 8 Hz	1. Metering Pulse [Metering Pulse Mode] 2. Battery Reverse
△	Green flash 32 Hz	Ringing
○	Red	Alarm
☼	Red flash 1 Hz	Alarm at Off Hook status

Fast Flashing light △: When either one of the 1~12 port is under metering pulse mode (that is, the LED light of that particular port is flashing green light), the metering pulse LED (12K or 16K, depending on its pulse frequency) will also flash in green light at the same time. But if the LED flashes because of battery reverse, the metering pulse LED (12K or 16K) will not have any response.

2.5 Jumper & LED Application

2.5.1 FXS Card

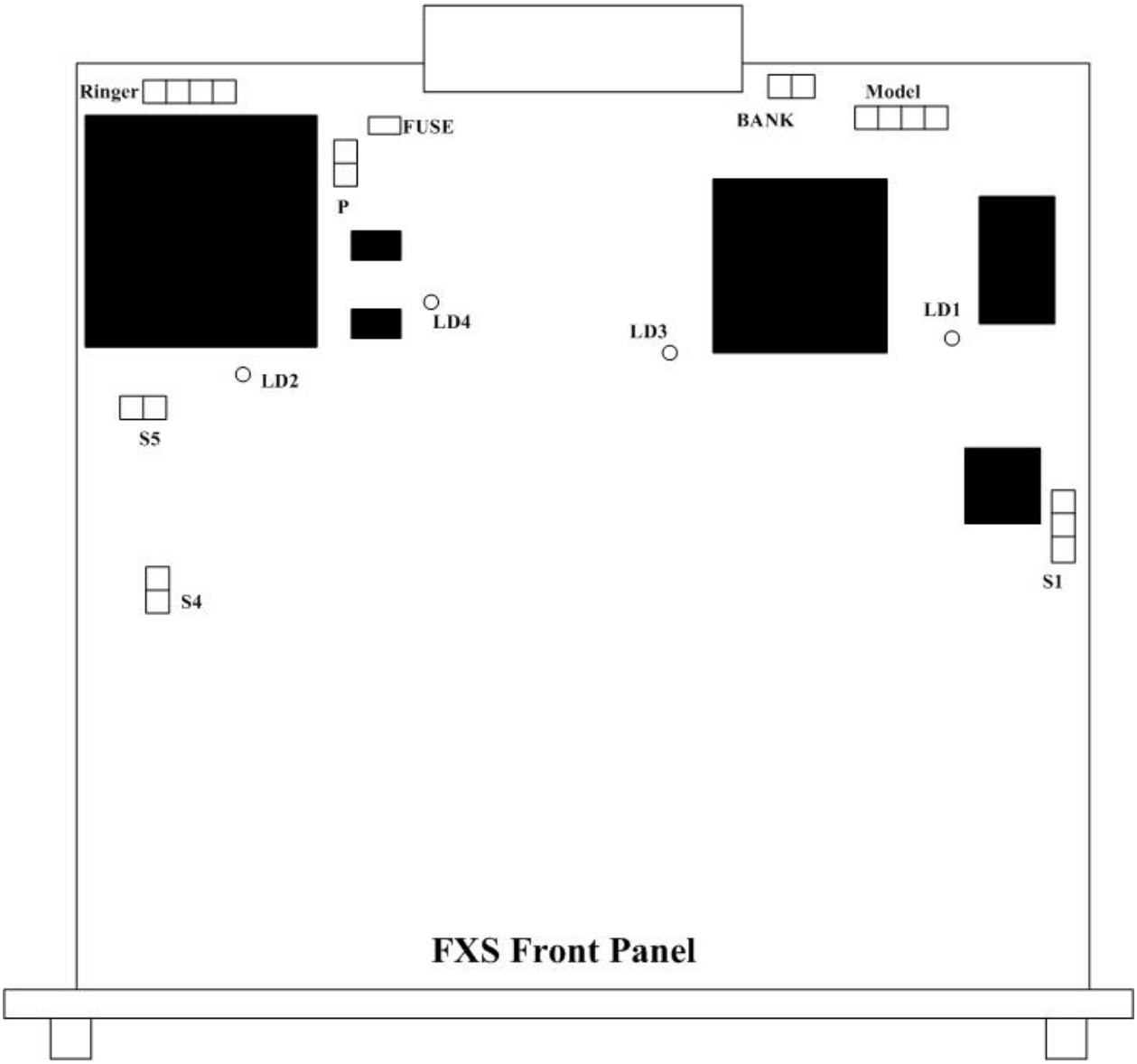


Figure 2-3 Jumper & LED locations on FXS PCB Board

2.5.1.1 LED on FXS PCB Board

LD1, LD3 are LED lights for showing each steps under device boot procedure. See below table for the color of the lights and the status they represent.

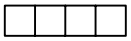
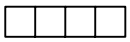
Steps under boot procedure	Time (sec)	LD1	LD3
Card plug-in	0	Red	Red
Run flash	1	Dark	Dark
Test RAM ok, check bank	4	Red	Dark
Load firmware to RAM	15	Dark	Red
Enter firmware	17	Red	Red
Load FPGA	27	Flash Red	Flash Red
FPGA ok, running	32	Dark	Dark
RAM or Flash fail	32	Red	-
FPGA or NW 1034 or FX 461 fail	32	-	Red

The function and application of other LED lights are listed below:

LED	Color	Description
FUSE	Normal	The input power of 12 FXS card is under 80Vac
	Break	The input power of 12 FXS card is over 80Vac. The LED lights (L1~L12) on the front panel will also shut down at the same time.
LD2	Red	Ring Generator on
	Off	Ring Generator off
LD4	Green	Input power under normal condition:-48V or -24V. FUSE under normal operation
	Off	FUSE breaks, no input power

Table 2-5 LED on FXS PCB Board: Function and Application

2.5.1.2 FXS Normal Jumper

Number	Name	Jumper Settings	Function	Default
JP1	P		PLAR bit set to OFF-Hook llll, Ring llll	
			PLAR bit set to user programmable	
JP2 **Note:** **Only available for 12FXS-GM**	Model		Normal (12FXS)	
			Metering pulse (12FXS-M)	
			Ground Start (12FXS-GS)	
		 or 	Metering + Ground (12FXS-GM)	
J3	BANK SW		Enable flash download to work under its default firmware bank	
			Switch the flash download working firmware bank (Bank 1, Bank 2)	
J9	Ringer	 or 	Ringer Output Voltage: 76 VAC	
			Ringer Output Voltage: 64 VAC	
			Ringer Output Voltage: 86 VAC	

: **Unjumpered**

: **Jumpered**

Table 2-6 Normal Jumper on FXS Card

2.5.1.3 FXS Special Jumper

Number	Name	Jumper Settings	Function	Default
J8	S1		FXS output line current: 25mA	
			FXS output line current: 30mA	
			FXS output line current: 35mA	
J7	S4		Disable alarm tone	
			Enable alarm tone	
J6	S5		Set ring generator to automatic (power saver) mode	
			Set ring generator to non-stop mode for special use (i.e. double ring tone)	

: **Unjumpered**

: **Jumpered**

Table 2-7 Special Jumper on FXS Card

2.5.2 FXO Card

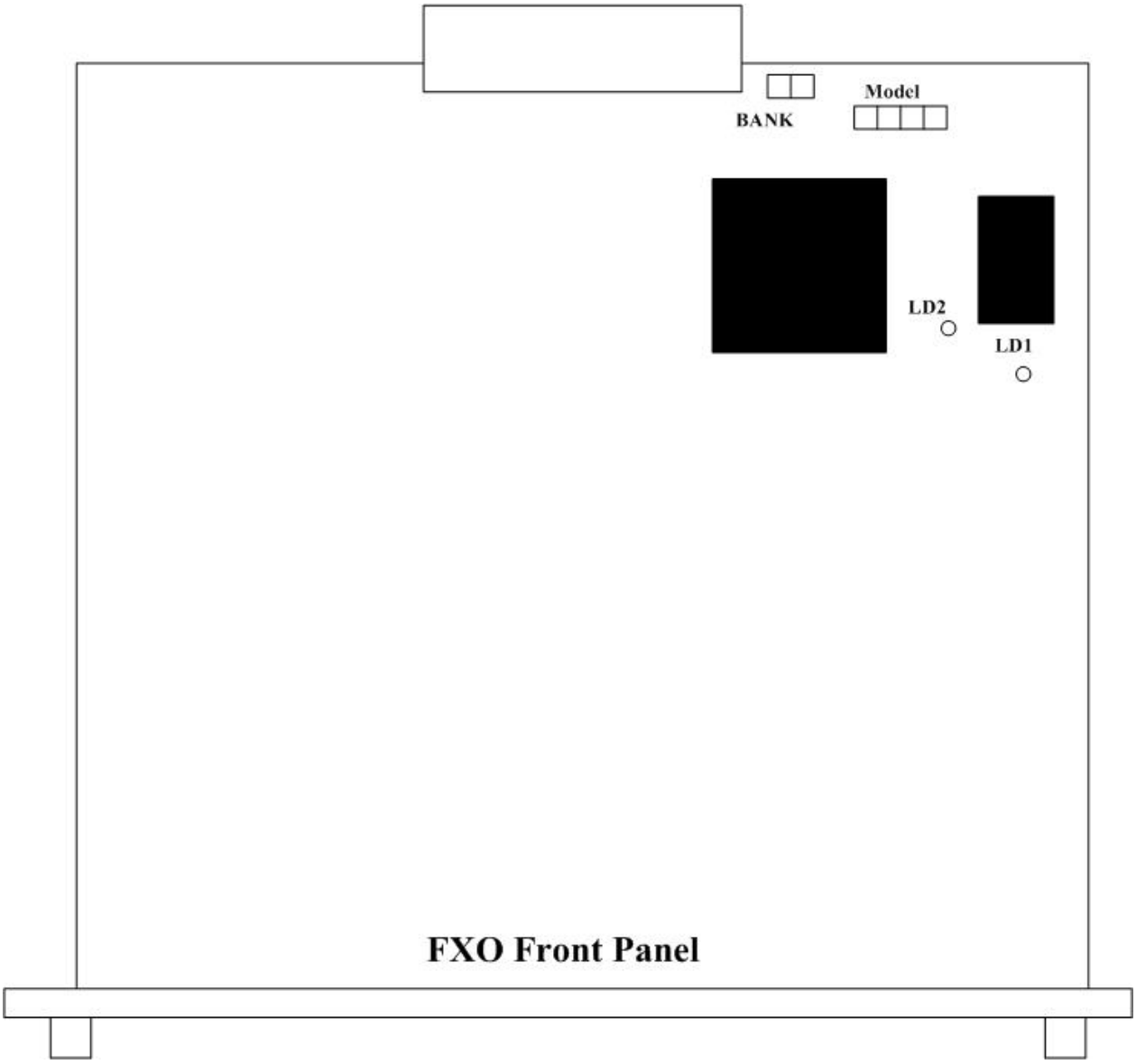


Figure 2-4 Jumper & LED locations on FXO PCB Board

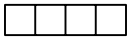
2.5.2.1 LED on FXO PCB Board

LD1, LD2 are LED lights for showing each steps under device boot procedure. See below table for the color of the lights and the status they represent.

Steps under boot procedure	Time (sec)	LD1	LD2
Card plug-in	0	Red	Red
Run flash	1	Dark	Dark
Test RAM ok, check bank	4	Red	Dark
Load firmware to RAM	15	Dark	Red
Enter firmware	17	Red	Red
Load FPGA	27	Flash Red	Flash Red
FPGA ok, running	32	Dark	Dark
RAM or Flash fail	32	Red	-
FPGA or NW 1034 or FX 461 fail	32	-	Red

Table 2-8 LED on FXO PCB Board: Function and Application

2.5.2.2 FXO Jumper

Number	Name	Jumper Settings	Function	Default
J9 **Only available for 12FXO-GM**	Model		Normal (12FXO)	
			Metering pulse (12FXO-M)	
			Ground Start (12FXO-GS)	
		 or 	Metering + Ground (12FXO-GM)	
J3	BANK SW		Bank switch unavailable	
			Switch the current firmware bank to the other	

: **Unjumpered**

: **Jumpered**

Table 2-9 Jumper on FXO Card

2.6 Signaling Bits

	FXS/FXS-P																							
	PLAR OFF								PLAR ON															
	FXS/FXS-P								FXS								FXS-P							
									TX				RX				TX				RX			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
On hook	0	1	0	1					0	1	0	1					0	1	0	1				
Off hook	1	1	0	1					1	1	1	1					1	1	0	1				
No ring					1	*	*	*					0	*	*	*					1	*	*	*
Ring on					0	0	*	*					1	1	1	1					0	0	*	*
Battery Reverse					0	1	0	0																
Metering Pulse					0	1	0	0																
Tip lead open					1	1	1	1																
Ring lead GND	0	0	0	1																				
OOS-Alarm					*	*	*	*					*	*	*	*					*	*	*	*

Table 2-10 Signaling Bits (Default Setting) - FXS Card

	FXO							
	TX				RX			
	A	B	C	D	A	B	C	D
On hook					0	*	*	*
Off hook					1	1	*	*
No ring	0	1	0	1				
Ring On	0	0	0	1				
Battery Reverse	0	1	0	0				
Metering Pulse	0	1	0	0				
Tip Lead open	1	1	1	1				
Ring lead GND					0	0	0	1
OOS-Alarm					*	*	*	*

Table 2-11 Signaling Bits (Default Setting) -FXO Card

3 TERMINAL OPERATION

3.1 FXS Sub-Menu

Under the Controller Menu, press “U” to choose a slot for the FXS port. Then the following screen will show.

```
SLOT 12 FXS                    === Port Menu ===            16:42:00 05/19/2009

Version      : SW V3.01.01 05/07/2009,  HW Ver.L




[DISPLAY]                                  [SETUP]
C -> System Configuration                  S -> System Setup
I -> FXS Status                            T -> Diagnostic Test
                                           G -> Upgrade Firmware



[LOG]                                      [MISC]
U -> Choose Other Slot                     Y -> Unit Load Default Config
F -> Log Off                               Z -> Unit Reset
O -> Log On
E -> Return to Main Menu



>>SPACE bar to refresh or enter a command ===>
```

3.1.1 System Configuration

Press "C" to view the system configuration as below.
EXAMPLE 1: When Metering Pulse is not available, the screen will show as below.

For FXS Normal mode PCB H/W Version F or over:

```
SLOT 12 FXS               === System Configuration ===      11:35:27 11/11/2008

A/u-Law : A      Impedance : 600 ohm
         L1     L2     L3     L4     L5     L6     L7     L8     L9     L10    L11    L12
TxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
RxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
                              ( -21 ~ +10 in dB )
Tx Signaling Bit   A   B   C   D        Rx Signaling Bit       A   B   C   D
         ON HOOK : 0   1   0   1                    RING ON : 0   0   *   *
        OFF HOOK : 1   1   0   1                   BATT-REV : 0   1   0   0
        RING-GND : ( NA )                         OOS-ALARM : *   *   *   *
  PLAR OFF HOOK : 1   1   1   1 (fixed)           TIP-OPEN : ( NA )
                                                PLAR RING ON : 1   1   1   1 (fixed)
PLAR Ring Cadence : 2"ON,4"OFF                      ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : ( NA )
Metering Freq.    : ( NA )
Metering Level    : ( NA )

PLAR        L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
            OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF


<< ESC key to return to previous menu, SPACE bar to refresh >>
```

For FXS-P mode PCB H/W Version F or over:

```
SLOT 12 FXS                    === System Setup ===            10:07:51 11/11/2008
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
A/u-Law : A      Impedance : 600 ohm
         L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
Tx Signaling Bit  A  B  C  D       Rx Signaling Bit      A  B  C  D
        ON HOOK : 0  1  0  1                   RING ON : 0  0  *  *
       OFF HOOK : 1  1  0  1         BATT-REV & PLS ON : 0  1  0  0
       RING-GND : ( NA )                    OOS-ALARM : *  *  *  *
  PLAR OFF HOOK : 1  1  0  1 (=OFF HOOK)     TIP-OPEN : ( NA )
                                        PLAR RING ON : 0  0  *  * (=RING ON)
PLAR Ring Cadence : 2"ON,4"OFF                ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : (NA)
Metering Freq.    : (NA)
Metering Level    : (NA)

PLAR       L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
           OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF
ALL PLAR = L1 : NO

<< Press ESC key to return to previous menu >>
```

Note:

1. FXS-P

<u>New mode</u>: put a jumper to JP1 for H/W Version H or over

<u>Old mode</u>: add a R367 resister in the back of the PCB for H/W Version

2. FXS-P mode PLAR bit can programmable when PLAR turns on
3. Regarding US ring back signaling for the FXS Card, PLAR generates a 440/480Hz ring-back tone (H/W version H or over).

EXAMPLE 2: When Metering Pulse and Ground start is available, the screen will show as below.

For FXS-GM mode PCB H/W Version H or over:

```
SLOT 12 FXS            === System Configuration ===            10:07:51 11/11/2008
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
A/u-Law : A      Impedance : 600 ohm
         L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
Tx Signaling Bit  A  B  C  D       Rx Signaling Bit      A  B  C  D
        ON HOOK : 0  1  0  1                   RING ON : 0  0  *  *
       OFF HOOK : 1  1  0  1         BATT-REV & PLS ON : 0  1  0  0
       RING-GND : 0  0  0  1                  OOS-ALARM : ( NA )
  PLAR OFF HOOK : 1  1  1  1 (fixed)          TIP-OPEN : 1  1  1  1
                                        PLAR RING ON : 1  1  1  1 (fixed)
PLAR Ring Cadence : 2"ON,4"OFF                ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : OFF
Metering Freq.    :  16 KHz
Metering Level    :  2.4Vrms

PLAR       L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
           OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF
ALL PLAR = L1 : NO

<< Press ESC key to return to previous menu >>
```

For FXS-GMP mode PCB H/W Version H or over:

```
SLOT 12 FXS                    === System Setup ===            10:07:51 11/11/2008
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
A/u-Law : A      Impedance : 600 ohm
         L1     L2     L3     L4     L5     L6     L7     L8     L9     L10    L11    L12
TxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
RxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
Tx Signaling Bit   A   B   C   D        Rx Signaling Bit       A   B   C   D
         ON HOOK : 0   1   0   1                      RING ON : 0   0   *   *
        OFF HOOK : 1   1   0   1           BATT-REV & PLS ON : 0   1   0   0
        RING-GND : 0   0   0   1                    OOS-ALARM : ( NA )
  PLAR OFF HOOK : 1   1   0   1 (=OFF HOOK)        TIP-OPEN : 1   1   1   1
                                                PLAR RING ON : 0   0   *   * (=RING ON)
PLAR Ring Cadence : 2"ON,4"OFF                      ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : OFF
Metering Freq.    :  16 KHz
Metering Level    :  2.4Vrms

PLAR        L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
           OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF   OFF
ALL PLAR = L1 : NO

<< Press ESC key to return to previous menu >>
```

Note:

1. FXS-GM mode with metering pulse 12KHz/16KHz and Ground start.
2. Metering Pulse Level

New mode: support level 2.4Vrms or 1 Vrms for H/W Version H or over.

Old mode: support level 0dBm or –24dBm for H/W Version F or below.

3. FXS-GMP

New mode: put a jumper for JP1 for H/W Version H or over. Than the PLAR bit can be programmable when PLAR is turned on.

Old mode: add a R367 resister in the back of the PCB for H/W Version F. Then, the PLAR bit can be programmable when PLAR is turned on.

3.1.2 FXS Status

Press "I" from the Port Menu to view the FXS status.

```
SLOT 12 FXS                    === FXS Status ===             11:38:07 11/11/2008


 1.OFF HOOK         :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 2.METERING PULSE   :  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA

 3.TIP-OPEN         :  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA

 4.RING-GND         :  NA  NA  NA  NA  NA  NA  NA  NA  NA  NA   NA   NA

 5.PLAR ON          :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 6.RINGING          :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 7.ALARM ON         :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12




<< press ESC key to return to main menu, SPACE key to refresh >>
```

3.1.3 System Setup

Press "S" from the Port Menu to setup system configuration. Use arrow keys to move cursor and TAB key to roll options.

NOTE1:	**ALL PLAR = L1: YES**, means that PLAR setting of L2 to L12 are same as L1. **ALL PLAR = L1: NO**, means that PLAR setting of L2 to L12 are different from L1.

NOTE2:	The option, **OOS-ALARM**, is only available for new E1 and new T1 interfaces.

EXAMPLE 1: When Metering Pulse is not available, the screen will show as below.

For FXS-GM mode PCB H/W Version H or over:

```
SLOT 12 FXS                    === System Setup ===          16:51:46 11/11/2008
ARROW KEYS: CURSOR MOVE, TAB/`: ROLL UP/DOWN OPTIONS
A/u-Law : A     Impedance : 600 ohm
         L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0   -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0   -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
Tx Signaling Bit  A  B  C  D       Rx Signaling Bit       A  B  C  D
        ON HOOK : 0  1  0  1                RING ON : 0  0  *  *
       OFF HOOK : 1  1  0  1              BATT-REV : 0  1  0  0
       RING-GND : ( NA )                 OOS-ALARM : *  *  *  *
  PLAR OFF HOOK : 1  1  1  1 (fixed)      TIP-OPEN : ( NA )
                                        PLAR RING ON : 1  1  1  1 (fixed)
PLAR Ring Cadence : 2"ON,4"OFF              ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : ( NA )
Metering Freq.    : ( NA )
Metering Level    : ( NA )

PLAR       L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
           OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF
ALL PLAR = L1 : NO

<< Press ESC key to return to previous menu >>
```

For FXS-GMP mode PCB H/W Version H or over:

```
SLOT 12 FXS                    === System Setup ===          16:51:46 11/11/2008
ARROW KEYS: CURSOR MOVE, TAB/`: ROLL UP/DOWN OPTIONS
A/u-Law : A     Impedance : 600 ohm
         L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0   -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0   -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
Tx Signaling Bit  A  B  C  D       Rx Signaling Bit       A  B  C  D
        ON HOOK : 0  1  0  1                RING ON : 0  0  *  *
       OFF HOOK : 1  1  0  1              BATT-REV : 0  1  0  0
       RING-GND : ( NA )                 OOS-ALARM : (NA)
  PLAR OFF HOOK : 1  1  1  1 (=OFF HOOK)      TIP-OPEN : 1 1 1 1
                                        PLAR RING ON :  0 0 * *  (=RING ON)
PLAR Ring Cadence : 2"ON,4"OFF              ( * for don't care )
Ring  Frequency   : 20   Hz
Metering Pulse    : OFF
Metering Freq.    : 16 KHZ
Metering Level    : 2.4 Vrms

PLAR       L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
           OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF  OFF
ALL PLAR = L1 : NO

<< Press ESC key to return to previous menu >>
```

Note:
1. FXS-GM mode with metering pulse 12KHz/16KHz and Ground start.
2. FXS-GMP
New mode: put a jumper to JP1 for H/W Version H or over. Than the PLAR bit can be programmable when PLAR turns on.
Old mode: add a R367 resister in the back of the PCB for H/W Version F. Then, the PLAR bit can be programmable when PLAR is turns on.
3. Regarding US ring back signaling for the FXS Card, PLAR generates a 440/480Hz ring-back tone (H/W version H or over)

3.1.4 Diagnostic Test

Press “T” from the Port Menu to do diagnostic test. Use TAB key to select the desired option. The current selection will be highlighted by an asterisk (*).

```
SLOT 12 FXS              === FXS Diagnostic Test ===       11:36:17 11/11/2008



 *1.RING TEST         2.BATTERY REVERSE TEST

- STATUS :

<< press ESC key to return to main menu >>
```

Press ENTER after done the selection. As the following example shows, the system is doing RING TEST.

```
SLOT 12 FXS              === FXS Diagnostic Test ===       11:36:17 11/11/2008



 *1.RING TEST         2.BATTERY REVERSE TEST

- STATUS :  Remain 12 seconds.

<< press ESC key to return to main menu >>
```

3.1.5 Upgrade Firmware

Press “G” from the Port Menu to start your flash download. Key in the server IP and firmware file name. Then, press Enter to start the download.

```
LOOP AM3440-A            === Download Firmware ===        16:42:24 05/19/2009
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit


Bank 1 Firmware Ver. : V3.01.01 05/07/2009  (Good)
Bank 2 Firmware Ver. : V3.01.01 05/07/2009  (Good)
Working Firmware Bank: 2
TFTP Server IP       : 010.003.013.010
Firmware File Name   :



<< press ESC key to return to main menu >>
```

3.1.6 Unit Load Default Configuration

Press “Y” from Port Menu to return the default. Then press “Y” or “N” to confirm the selection.

```
SLOT 12 FXS                   === Unit Menu ===            11:36:39 11/11/2008


Load default - are you sure (Y/N)?
```

3.1.7 Unit Reset

Press “Z” from Port Menu to reset the unit. Then press “Y” or “N” to confirm the selection.

```
SLOT 12 FXS                   === Unit Menu ===            11:36:39 11/11/2008




Reset - are you sure ? [Y/N]
```

If users enter "Y" to confirm the reset, the system will request users to enter the password, LOOP, then press ENTER.

```
SLOT 12 FXS                   === Unit Menu ===            11:36:39 11/11/2008




==>> Enter password :
```

3.2 FXO Sub-Menu

Under the Controller Menu, press “U” to choose a slot for the FXO port. Then the following screen will show.

```
SLOT 1  FXO                    === Port Menu ===            16:32:48 05/19/2009

Version      : SW V2.01.01 05/07/2009,  HW Ver.G




[DISPLAY]                                    [SETUP]
C -> System Configuration                     S -> System Setup
I -> FXO Status                               T -> Diagnostic Test
                                              G -> Upgrade Firmware



[LOG]                                        [MISC]
U -> Choose Other Slot                      Y -> Unit Load Default Config
F -> Log Off                                 Z -> Unit Reset
O -> Log On
E -> Return to Main Menu



>>SPACE bar to refresh or enter a command ===>
```

3.2.1 System Configuration

Under the above menu, press "C" to view the system configuration as below.

EXAMPLE 1: When Metering Pulse is not available, the screen will show as below.

```
SLOT 1 FXO               === System Configuration ===        16:32:48 05/19/2009

A/u-Law : A      Impedance : 600 ohm
         L1     L2     L3     L4     L5     L6     L7     L8     L9     L10    L11    L12
TxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
RxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
                            ( -21 ~ +10 in dB )
 Tx Signaling Bit         A  B  C  D        Rx Signaling Bit  A  B  C  D
                RINGING : 0  0  0  1                OFF-HOOK : 1  1  *  *
                NO RING : 0  1  0  1               OOS-ALARM : *  *  *  *
               BATT-REV : 0  1  0  0                RING-GND : 0  0  0  1
               PULSE ON : 0  1  0  0                   ( * for don't care )
               TIP-OPEN : 1  1  1  1
Trunk Condition : ON-HOOK
Line Polarity   : NORMAL

Metering Pulse Frequency   : 16 KHz
Metering Pulse Detect Mode : NORMAL
Minimum Pulse Decode Level ( -19 ~ -47 )
               L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
               -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27 (dBm)


<< ESC key to return to previous menu, SPACE bar to refresh >>
```

EXAMPLE 2: When Metering Pulse is available, the screen will show as below.

```
SLOT 1 FXO               === System Configuration ===        16:32:48 05/19/2009

A/u-Law : A      Impedance : 600 ohm
         L1     L2     L3     L4     L5     L6     L7     L8     L9     L10    L11    L12
TxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
RxGain: -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0   -3.0
                            ( -21 ~ +10 in dB )
 Tx Signaling Bit         A  B  C  D        Rx Signaling Bit  A  B  C  D
                RINGING : 0  0  0  1                OFF-HOOK : 1  1  *  *
                NO RING : 0  1  0  1               OOS-ALARM : *  *  *  *
               BATT-REV : 0  1  0  0                RING-GND : 0  0  0  1
               PULSE ON : 0  1  0  0                   ( * for don't care )
               TIP-OPEN : 1  1  1  1
Trunk Condition : ON-HOOK
Line Polarity   : NORMAL

Metering Pulse Frequency   : 16 KHz
Metering Pulse Detect Mode : NORMAL
Minimum Pulse Decode Level ( -19 ~ -47 )
               L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
               -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27 (dBm)


<< ESC key to return to previous menu, SPACE bar to refresh >>
```

Note:
* represents “don’t care”.
If OOS-Alarm is set as ****, it means the OOS alarm function is now disabled.
If Ring-GND is set as ****, it means the ring-GND function is now disabled.
If OFF-HOOK status is set as ****, it means the OFF-HOOK function is now disabled.
If the software version is V2.01.03 or after and the OFF-HOOK status is set as ****, it means all twelve ports are set as OFF-HOOK.

3.2.2 FXO Status

Under FXO Port Menu, press “I” to display status of FXO interface, then the screen will show as below.

EXAMPLE 1:

When Ground Start is not available, the system will show up “NO AVAILABLE” for TIP-OPEN and RING-GND. When Metering Pulse is not available, the system will show up “NO AVAILABLE” for PULSE ON.

```
SLOT 1 FXO                    === FXO Status ===          16:32:48 05/19/2009


 1.RINGING     :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 2.OFF-HOOK    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 3.TIP-OPEN    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 4.RING-GND    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 5.BATT-REV    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 6.PULSE ON    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12

 7.ALARM ON    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  L12




<< press ESC key to return to main menu, SPACE key to refresh >>
```

EXAMPLE 2:

When Ground Start and Metering Pulse are available, the screen will show as below.

```
SLOT 1  FXO                   === FXO Status ===          16:32:48 05/19/2009


 1.RINGING     :  L1  L2  ■   L4  L5  L6  ■   L8  L9  L10  L11  L12

 2.OFF-HOOK    :  L1  ■   L3  ■   L5  ■   L7  L8  ■   ■■   L11  ■■

 3.TIP-OPEN    :  ■   L2  L3  L4  ■   L6  L7  ■   L9  L10  L11  L12

 4.RING-GND    :  L1  ■   L3  L4  ■   L6  ■   L8  L9  L10  L11  L12

 5.BATT-REV    :  L1  L2  L3  L4  L5  L6  L7  L8  L9  L10  L11  ■■

 6.PULSE ON    :  L1  L2  L3  L4  L5  ■   L7  L8  L9  L10  L11  L12

 7.ALARM ON    :  L1  L2  L3  ■   L5  L6  L7  L8  ■   ■■   L11  L12




<< press ESC key to return to main menu, SPACE key to refresh >>
```

NOTE1: L1 means the status of Line1 and ■ means the status of Line1 is active.
As the above example shows:

1. RINGING: ■ means the status of Line 3 is receiving RINGING;
2. TIP-OPEN: ■ means the status of Line 1 is Tip-Open;
3. PULSE ON: ■ means the status of Line 6 is receiving PULSE signal.

3.2.3 System Setup

Under FXO Port Menu, press “S” to setup FXO system, then the following screen will show up.

When L1’s decode level value is changed, L2’s value will be automatically changed by the system. Also if L2’s value is changed, L1’s value will be changed too. Same operation is applied for L3 and L4, L5 and L6, L7 and L8, L9 and L10, L11 and L12

The option **Metering Pulse Detect Mode** is allowed to select a desired detect mode of pulse. Two modes, **NORMAL** and **PACKET**, are available here. Use TAB key to switch a desired item.
For **NORMAL** mode (Tone Follower mode), a logic level for the period of a correct decode.
For **PACKET** mode, respond/ de-respond after a cumulative period of tone or no-tone in a preset period.

EXAMPLE 1: When Metering Pulse is not available, the screen will show as below.

```
SLOT 1 FXO              === System Configuration ===      16:32:48 05/19/2009
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
A/u-Law : A     Impedance : 600 ohm
        L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
 Tx Signaling Bit         A  B  C  D        Rx Signaling Bit  A  B  C  D
                RINGING : 0  0  0  1                OFF-HOOK : 1  1  *  *
                NO RING : 0  1  0  1               OOS-ALARM : *  *  *  *
               BATT-REV : 0  1  0  0                RING-GND : 0  0  0  1
               PULSE ON : 0  1  0  0                   ( * for don't care )
               TIP-OPEN : 1  1  1  1
Trunk Condition : ON-HOOK
Line Polarity   : NORMAL


<< Press ESC key to return to previous menu >>
```

EXAMPLE 2: When Metering Pulse is available, the screen will show as below. This screen is allowed to setup metering pulse frequency, pulse mode, and minimum pulse decode level for each line.

```
SLOT 1 FXO              === System Configuration ===      16:32:48 05/19/2009
ARROW KEYS: CURSOR MOVtE, TAB: ROLL OPTIONS
A/u-Law : A     Impedance : 600 ohm
        L1    L2    L3    L4    L5    L6    L7    L8    L9    L10   L11   L12
TxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
RxGain: -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0  -3.0
ALL Tx/Rx Gain = L1 : NO  ( -21 ~ +10 in dB )
 Tx Signaling Bit         A  B  C  D        Rx Signaling Bit  A  B  C  D
                RINGING : 0  0  0  1                OFF-HOOK : 1  1  *  *
                NO RING : 0  1  0  1               OOS-ALARM : *  *  *  *
               BATT-REV : 0  1  0  0                RING-GND : 0  0  0  1
               PULSE ON : 0  1  0  0                   ( * for don't care )
               TIP-OPEN : 1  1  1  1
Trunk Condition : ON-HOOK
Line Polarity   : NORMAL

Metering Pulse Frequency   : 16 KHz
Metering Pulse Detect Mode : NORMAL
Minimum Pulse Decode Level ( -19 ~ -47 )
              L1   L2   L3   L4   L5   L6   L7   L8   L9   L10  L11  L12
             -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  -27  (dBm)
ALL Level= L1 : NO

<< Press ESC key to return to previous menu >>
```

NOTE1: **ALL Level= L1 : NO,** this option is allowed to copy Line 1’s pulse decode value to all lines or not. Use TAB key to switch YES (copy to all) or NO (not copy to all).

NOTE2: * represents “don’t care”.
If OOS-Alarm is set as ****, it means the OOS alarm function is now disabled.
If Ring-GND is set as ****, it means the ring-GND function is now disabled.
If OFF-HOOK status is set as ****, it means the OFF-HOOK function is now disabled.
If the software version is V2.01.03 or after and the OFF-HOOK status is set as ****, it means all twelve ports are set as OFF-HOOK.

3.2.4 Diagnostics Test

Under FXO Port Menu, press “T” to do diagnostics test, then the screen will show as below. Two options are available for diagnostics test: OFF-HOOK TEST and PULSE DECODE LEVEL SCAN. Use TAB key to select the desired option. The current selection will be highlighted by an asterisk (*).

OFF-HOOK TEST:

```
SLOT 1 FXO               ===  Diagnostic Test ===          16:32:48 05/19/2009



 *1.OFF-HOOK TEST          2.PULSE DECODE LEVEL SCAN




- STATUS :  Remain 11 seconds.









<< press ESC key to return to main menu >>
```

PULSE DECODE LEVEL SCAN:

After done the scan of pulse decode level, the system will show up detected value of each line in the screen. Press “Y” to copy the detected value to Pulse Decode Level of System Setup screen. Or press “N” or ESC key to cancel the copy.

NA means no found any signal in line.

```
SLOT 1 FXO            === FXO Diagnostic Test ===          16:32:48 05/19/2009



  1.OFF-HOOK TEST         *2.PULSE DECODE LEVEL SCAN




- STATUS :

Detected Value
             L1   L2   L3   L4   L5   L6   L7   L8   L9  L10  L11  L12
             NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA  (dBm)

Copy Detected Value to System Setup (Pulse Decode Level) (Y/N)



<< press ESC key to return to main menu >>
```

3.2.5 Upgrade Firmware

Press “G” from the Port Menu to start your flash download. Key in the server IP and firmware file name. Then, press Enter to start the download.

```
LOOP AM3440-A          === Download Firmware ===        16:33:31 05/19/2009
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit


Bank 1 Firmware Ver. : V2.01.01 04/20/2009  (Good)
Bank 2 Firmware Ver. : V2.01.01 05/07/2009  (Good)
Working Firmware Bank: 2
TFTP Server IP       : 010.003.013.010
Firmware File Name   :



<< press ESC key to return to main menu >>
```

3.2.6 Unit Load Default Configuration

Press “Y” from Port Menu to return the default. Then press “Y” or “N” to confirm the selection.

```
SLOT 1 FXO                    === Unit Menu ===                16:32:48 05/19/2009



Load default - are you sure (Y/N)?
```

3.2.7 Unit Reset

Press “Z” from Port Menu to reset the unit. Then press “Y” or “N” to confirm the selection.

```
SLOT 1 FXO                    === Unit Menu ===                16:32:48 05/19/2009


Reset - are you sure ? [Y/N]
```

If users enter "Y" to confirm the reset, the system will request users to enter the password, LOOP, then press ENTER.

```
SLOT 1 FXO                    === Unit Menu ===                16:32:48 05/19/2009


==>> Enter password :
```